

PATENT SPECIFICATION

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(21) Application No. 24989/74 (22) Filed 5 June 1974 (19)

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G1W E4B1 E4B2 E4CW E4CX E4L8
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(72) Inventors ION TIGANAS and ION FEIMER

(54) LOAD-APPLYING APPARATUS FOR USE WITH A VEHICLE ROLLER
BRAKE TESTING STAND



(71) We, INSTITUT DE STUDII SI CER-
CETARI TRANSPORTURI, a Rumanian Body
Corporate, of Calea Grivitei 393, Bucharest,
Rumania, do hereby declare the invention,
for which we pray that a patent may be
granted to us, and the method by which it
is to be performed, to be particularly de-
scribed in and by the following statement:—
The present invention relates to load
applying apparatus for use with a roller
brake testing stand determining maximum
braking forces of motor vehicles, irrespec-
tive of their loading.
At present the most frequently used sys-
tem for detecting malfunctions in the brake
systems of motor vehicles is a roller brake
testing stand. The brake testing stand con-
sists of two symmetrical parts each includ-
ing an electric motor, a reduction gear box,
and two driving rollers between which a
wheel of a motor vehicle to be tested is
placed.
The wheel of the motor vehicle is driven
by the driving rollers at a certain speed.
When the brakes of the motor vehicle are
applied, a retarding force is exerted on the
rollers by the tyre, which is equal to the
braking force applied to that wheel. This
force is, however, limited by the static co-
efficient of friction between the wheel and
the roller, which is rather small: 0.57—0.7.
According to the present invention there is
provided load-applying apparatus for use in
conjunction with a roller brake stand deter-
mining the maximum braking force of a

on the roller and to move the wheel of
the roller by an upward movement of
ram, a pressure fluid supply to the
including fluid pressure control means
table for the delivery of fluid at a des-
pressure, and fluid diverting means for ef-
ing movement of the ram in one or o
direction.

An embodiment of the present inven-
will now be described with reference to
accompanying drawings in which:

Fig. 1 is a schematic diagram illustra-
apparatus for determining maximum b-
ing forces of motor vehicles including b-
applying apparatus according to the
sent invention;

Fig. 2 is a sectional elevation of the p-
sure regulator of the load-applying app-
tus; and

Fig. 3 is a plan view of the pressure r-
lator of the Fig. 2.

With reference to Figs. 1 to 3, load-ap-
ing apparatus for use with a roller b-
testing stand determining maximum b-
ing forces of motor vehicles comprise
vertically arranged double acting hydra-
ram 1 which by means of brackets 2
holding systems 3 engages an axle 4 of
motor vehicle placed on two pairs of ro-
5 of the brake testing stand either to f-
the wheels of the vehicle against the ro-
or lift them up therefrom. Means
shown) are provided anchoring the
cylinder for downward movement of
ram.

ERRATUM

SPECIFICATION NO 1464614

Page 1, line 1, (71) after We, delete INSTITUT insert INSTITUTUL

THE PATENT OFFICE
1 August 1977

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BRAKE TESTING STAND

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Corporate, of Calea Grivitei 393, Bucharest,
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for which we pray that a patent may be
granted to us, and the method by which it
is to be performed, to be particularly de-
scribed in and by the following statement:—

The present invention relates to load
applying apparatus for use with a roller
brake testing stand determining maximum
braking forces of motor vehicles, irrespec-
tive of their loading.

At present the most frequently used sys-
tem for detecting malfunctions in the brake
systems of motor vehicles is a roller brake
testing stand. The brake testing stand con-
sists of two symmetrical parts each includ-
ing an electric motor, a reduction gear box,
and two driving rollers between which a
wheel of a motor vehicle to be tested is
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The wheel of the motor vehicle is driven
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braking force applied to that wheel. This
force is, however, limited by the static co-
efficient of friction between the wheel and
the roller, which is rather small: 0.57—0.7.

According to the present invention there is
provided load-applying apparatus for use in
conjunction with a roller brake stand deter-
mining the maximum braking force of a
motor vehicle, comprising a double-acting
fluid operable ram for vertical location in
the stand and adapted for securement in
the stand to enable downward operative
movement of the ram; an elongate bar for
location transversely of the vehicle, to an
intermediate portion of which bar the ram
is attached, spaced coupling devices on the
bar engageable with an axle or wheel sus-
pension member of the vehicle to force a
wheel of the vehicle against a roller of the
stand by a downward operative movement
of the ram when the wheel is positioned

on the roller and to move the wheel clear
of the roller by an upward movement of the
ram, a pressure fluid supply to the ram
including fluid pressure control means set-
table for the delivery of fluid at a desired
pressure, and fluid diverting means for effect-
ing movement of the ram in one or other
direction.

An embodiment of the present invention
will now be described with reference to the
accompanying drawings in which:

Fig. 1 is a schematic diagram illustrating
apparatus for determining maximum brak-
ing forces of motor vehicles including load-
applying apparatus according to the pre-
sent invention;

Fig. 2 is a sectional elevation of the pres-
sure regulator of the load-applying appa-
ratus; and

Fig. 3 is a plan view of the pressure regu-
lator of the Fig. 2.

With reference to Figs. 1 to 3, load-apply-
ing apparatus for use with a roller brake
testing stand determining maximum brak-
ing forces of motor vehicles comprises a
vertically arranged double acting hydraulic
ram 1 which by means of brackets 2 and
holding systems 3 engages an axle 4 of a
motor vehicle placed on two pairs of rollers
5 of the brake testing stand either to force
the wheels of the vehicle against the rollers
or lift them up therefrom. Means (not
shown) are provided anchoring the ram
cylinder for downward movement of the
ram.

A hydraulic circuit for the ram 1 includes
an oil reservoir 6, a hydraulic pressure pump
7 driven by an electric motor 8, a first
hydraulic distributor 9 located on an opera-
tor's desk and adapted to initiate movement
of the hydraulic ram in one or other direc-
tion, a second hydraulic distributor 10
located near the hydraulic ram and adapted
to repeat the operations of the distributor 9,
hydraulic fluid pipes 11 connecting the ele-
ments of the hydraulic circuit, a pressure
regulator A for controlling the pressure of
fluid in pipes 11, and a manometer or pres-

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sure gauge 12 for measuring the actual pressure in the pipes 11 for use in setting the pressure regulator A as will be explained below, the regulator A and gauge 12 being

5 located on the operator's desk.
The pressure regulator A is in the form of a pressure relief valve (see Fig. 2) fluidly connected to the pipe 11 by connection 21 and includes a diverting branch 22 for diversion of oil to the oil reservoir 6 when the oil pressure exceeds a predetermined value. Oil flow through the diverting branch is controlled by a valve piston 20 movable rightwards as viewed in Fig. 2 by the oil in pipe 11 but biased leftwards to a diversion closure position by a helical spring 19 located between end caps 17, 18. End cap 18 engages piston 20, while cap 17 is axially movable by a shaft 16 which is threaded to a body part of the regulator A and is rotatable by a wheel 15 keyed to the shaft 16. Wheel 15 is rotated by pinion 14 which is manually adjustable by handle 13 to alter the tension of spring 19 and thereby the pressure setting of the valve. The pinion 14 is also rotatably coupled to an elongate threaded shaft 23, and a rotationally restrained indicator element 24 is threaded on the shaft 23 to thereby be axially movable on rotation of pinion 14 for indication of the valve setting on a scale 25. The scale 25 includes an upper portion indicating the pressure setting and a lower portion indicating the set load applied to the axle of the vehicle. A threaded stud 27 threadingly engages head 26 fixed to scale 25 and is adjustable to move the scale 25, and the scale can thereby be set to the correct datum after ascertaining the actual pressure in pipes 11 by means of gauge 12.

Using the above described apparatus the following advantages are obtained:

— the maximum braking forces of motor vehicles may be determined on existing roller brake testing stands irrespective of their loads, thus providing precision in the evaluation of the braking capacity of the vehicle;

— the interpretation of the results obtained, on the roller brake testing stand is possible for any kind of motor vehicle, even if a particular one is tested for the first time on the stand and the braking force characteristic dependent on the force that presses the brake pedal is unknown;

— the results thus obtained are valid for any kind of friction material used for brakes;

— the results are gained rapidly, without calculations and interpretations, thus excluding errors;

— the hydraulic ram can also be used, due to its double action for lifting up the wheel clear of the rollers, thus enabling convenient adjustment of the brakes with

the vehicle at the testing location. In this case the full force of the ram would be used.

WHAT WE CLAIM IS:—

1. Load-applying apparatus for use in conjunction with a roller brake stand determining the maximum braking force of a motor vehicle, comprising a double-acting fluid operable ram for vertical location in the stand and adapted for securement in the stand to enable downward operative movement of the ram; an elongate bar for location transversely of the vehicle, to an intermediate portion of which bar the ram is attached, spaced coupling devices on the bar engageable with an axle or wheel suspension member of the vehicle to force a wheel of the vehicle against a roller of the stand by a downward operative movement of the ram when the wheel is positioned on the roller and to move the wheel clear of the roller by an upward movement of the ram, a pressure fluid supply to the ram including fluid pressure control means settable for the delivery of fluid at a desired pressure, and fluid diverting means for effecting movement of the ram in one or other direction.

2. Apparatus as claimed in claim 1, wherein fluid pressure indicating means are provided enabling the setting of the pressure fluid control means to be checked.

3. Apparatus as claimed in claim 1 or 2, wherein the pressure fluid is oil and the fluid supply includes an oil reservoir, and a hydraulic pressure pump driven by a drive motor.

4. Apparatus as claimed in any one of the preceding claims, wherein the fluid pressure control means and a mechanism for operation of the fluid diverting means are positioned remote from the ram for convenience of the operator, and fluid diverting means is positioned adjacent the ram and is actuable for movement of the ram in one direction or the other.

5. Apparatus as claimed in Claim 3, wherein the fluid pressure control means comprises a pressure relief valve connected to the line supplying the pressure oil to the ram; the pressure relief valve including a diverting portion for diversion of oil to the oil reservoir when a selected oil pressure is exceeded, a valve member for control of oil flow through said diverting portion and movable by the oil, a spring for biasing said valve member to a position closing said diverting portion, manually operable setting means for setting the tension of said spring and thereby the set pressure of the valve, and indicating means operatively coupled to said setting means for indicating the pressure setting.

6. Apparatus as claimed in claim 5, wherein an adjuster is provided to adjust the datum of said indicating means.

7. Apparatus as claimed in claim 5 or 6, wherein the indicating means includes a first gauge providing a visual indication of the desired oil pressure in the supply line, and a second gauge indicating the desired force exerted on the tested vehicle by a downward operative movement of the ram.
8. Load-applying apparatus for use with a roller brake testing stand substantially as hereinbefore described with reference to and as illustrated in the accompanying drawings.

FITZPATRICKS,
Chartered Patent Agents,
14—18 Cadogan Street,
Glasgow, G2 6QW,

and
Warwick House, Warwick Court,
London, WC1R 5DJ.

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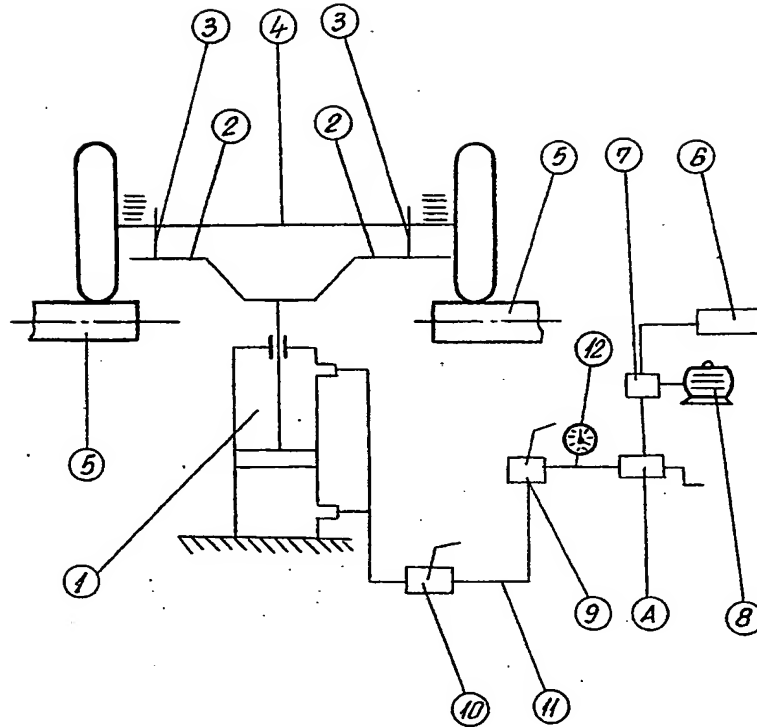


Fig. 1

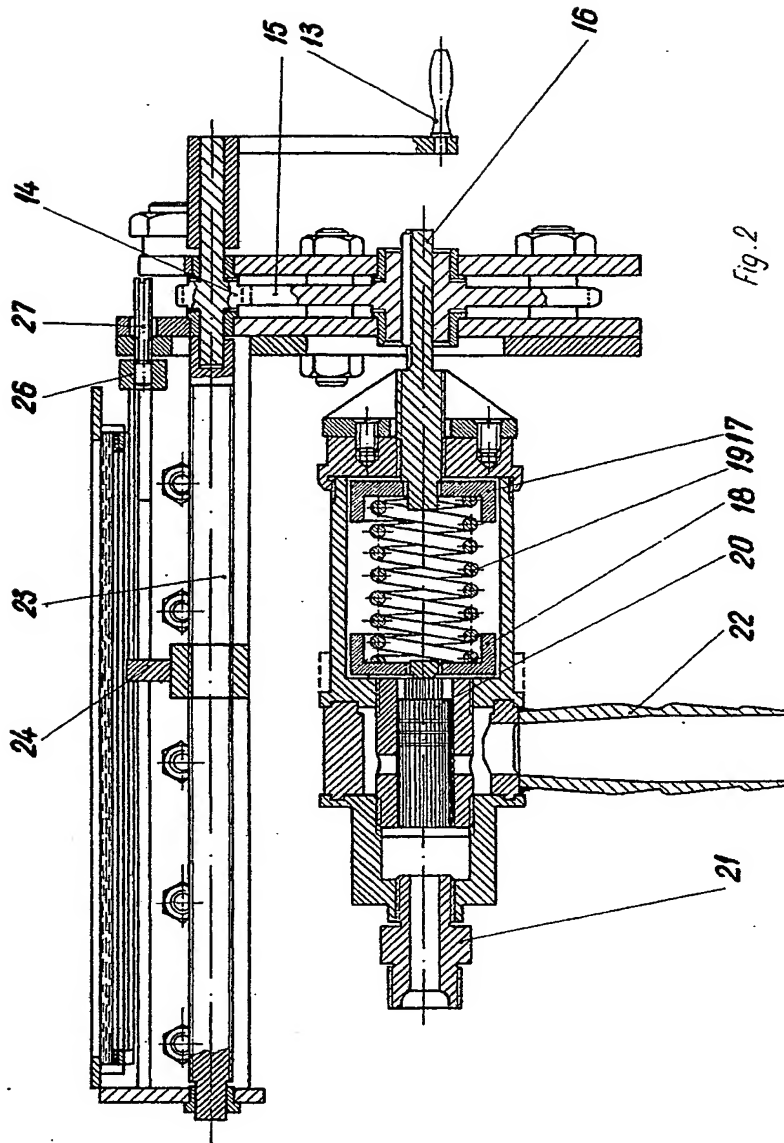
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COMPLETE SPECIFICATION

3 SHEETS

This drawing is a reproduction of
the Original on a reduced scale

Sheet 2



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COMPLETE SPECIFICATION

3 SHEETS

*This drawing is a reproduction of
the Original on a reduced scale
Sheet 3*

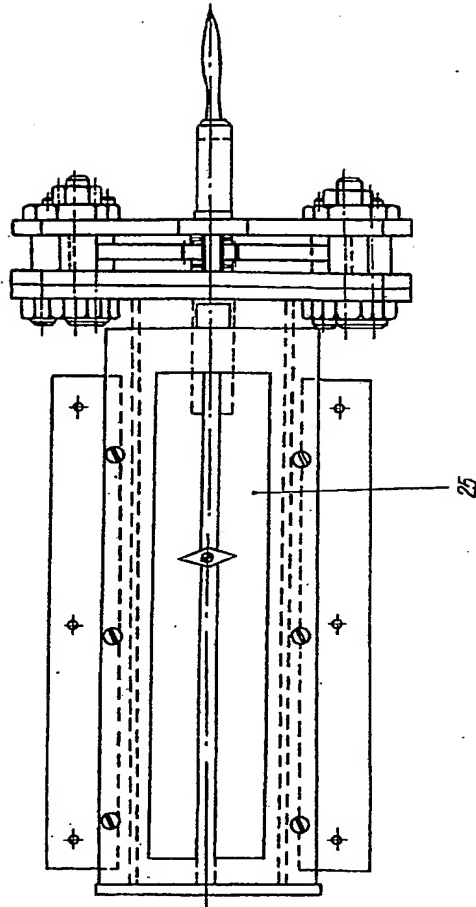


Fig. 3

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